



STATISTICS

OF

Mines and Minerals

IN


*NORTH CAROLINA.*

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Collected by the Mining Board, of Charlotte, N. C.

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CHARLOTTE, N. C.  
OBSERVER BOOK AND STEAM POWER PRINT.  
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## MEMORIAL.

*To the Honorable the Senate and House of Representatives of  
the Forty-Fifth Congress of the United States :*

The undersigned, citizens of the Sixth Congressional District of North Carolina, feeling a deep interest in the material prosperity of the country at large, and more particularly representing the mining interest of the South Atlantic States, believing, as we do, that the future prosperity of the government of the United States does to a great degree depend upon the development of her mineral wealth, respectfully call the attention of your honorable body to the following fact, viz: That the gold producing area of North Carolina covers about twelve thousand (12,000) square miles, containing one hundred and forty (140) mines already more or less developed; also containing large coal, iron and copper areas. Yield of gold in the following South Atlantic States, up to June 30th, 1877, as officially reported:

North Carolina.....	\$10,370,492	18-100
Virginia .....	1,641,343	89-100
South Carolina .....	1,382,455	76-100
Georgia .....	7,451,591	82-100

This is far below the actual yield.

In consideration whereof, and calling your special attention to the accompanying statistics, we would ask that a Commissioner be appointed for the above named South Atlantic States to examine both the quality and number of mines at an early day, and report the result of such investigation, together with suggestions to your honorable body.

With the hope that this prayer may have your earliest and most favorable consideration,

Respectfully submitted.



## Statistics of Mines and Minerals of North Carolina.

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At a meeting of the citizens of Charlotte, N. C., held January 25th, 1878, to consider some practicable method of advancing the mining interests of this section, and particularly of this State, a Mining Board was organized, and measures were taken to collect such facts as might bear on the subject, and to bring these interests to the attention of all persons concerned in mining, both here and abroad.

The members of this Board are impressed with the magnitude of the material interests involved, and are fully conscious of the influence which these mineral resources may and ought to have on the future industrial condition of this section, and, through the prosperity of this section, on the welfare of the country at large.

It has fallen to the lot of some of them in the course of their business and professional pursuits to become acquainted with the extent and the nature of these hidden gifts of providence; they at least are sure that few parts of our country of similar area are so highly favored.

These resources are well represented in each of the four great departments of mining industry, viz: The Precious Metals, Iron, Copper and Coal.

Of mines yielding the Precious Metals, there are at least 140 known to the Mining Board, situated in North

Carolina, and about 40 in the contiguous parts of South Carolina.

### EXTENT OF THE AURIFEROUS AREA.

Gold is found here and there in at least one half of the State, but the portion productive on a working scale is considerably less, embracing about one-fourth of the entire area—12,000 square miles; it extends from Moore and Franklin counties on the east, nearly to the Tennessee line on the west. Within these limits may be found illustrations of every mode of occurrence of Gold—placers, gravel washings, beds, veins, and bottoms of streams. Within this area, too, are at least three different geological formations, each furnishing ores with peculiar characters.

### GEOLOGICAL DISTRIBUTION OF MINES.

The best known mines are upon the central belt of granite (for such it may be termed in a general way), stretching across the State in a N. E. and S. W. direction, with a width of 10 to 25 miles; the towns of Greensboro and Charlotte being nearly on its axis; this area is commonly regarded by geologists as among the oldest on the North American continent.

To the east is a large body of slates, generally argillaceous, with a width varying from 15 to 50 miles; this region also abounds in mines, but it

has been less explored. To the west is a still larger area, made up for the most part of gneissoid and schistose formations, and extending nearly or quite to the Tennessee border; this area, too, has a large number of mines, but the most valuable deposits are placers and gravel washings.

#### EARLY HISTORY OF GOLD MINING.

It is highly probable that gold was mined in this State as early as the Revolutionary war, but only in a small way by washing beds of streams. The discovery of the famous 28 pound nugget at the Reed Mine, in Cabarrus county, (then Mecklenburg) occurred in 1799, but regular operations were prosecuted only some years after; by the year 1825 the Carolina gold mines had become well known at the North and abroad. A Legislative Report of 1830 puts the ascertained production at \$500,000 per annum. Thus far work had been done only on placer mines, but the speedy exhaustion of these compelled the miners to hunt the veins which had been the source of such riches.

The large number of veins found put entirely new conditions to this now important industry.

Neither the circumstances, the knowledge nor the skill of that period were favorable to operations planned on a scale, or with aims such as we now witness in our Western territories; had they been so the entire industrial condition of the State would have been completely changed; to this day nearly all mining work has been of the most desultory character. The veins were worked generally by farmers, who spent their odd time in these enterprises, using their slaves

(otherwise unoccupied) as miners; the waste attending such random work was enormous, but as ores were abundant and rich, and easily and cheaply treated, there was no incentive to economy. When the permanent water line was reached—generally at the depth of 40 to 60 feet—the ore changed to refractory sulphurets, and as expensive pumping and hoisting machinery was necessary, and as all operations needed to be continuous, the work, as then conducted, ceased to be profitable, and mine after mine was discontinued; the larger number remain abandoned to this day.

The five years preceding the war witnessed a revival of mining industry, and a real progress was made towards a mastery of the methods of dealing with sulphurets in an economical and thorough manner. But the all-absorbing issues of that struggle diverted all efforts in this direction, and at its close but one mine was in operation, and that only in a fitful manner.

#### THE MINING OF THE FUTURE.

The dependence of the country hereafter will be on deep lying ores containing 15 to 30 per cent of sulphurets, mainly iron pyrites; occasional bunches of copper pyrites are found in a large number of mines, which is sometimes present in proportions large enough to be smelted for copper alone, though in any rationally conducted treatment the contents in gold and silver are important enough to give a good margin of profit. From a large number of analyses made from ores of every variety and from numerous mines, it may be said that there is hardly one which will not



yield ores ranging in contents from \$50 to \$500 per ton, and not unfrequently pockets of ore are met with, which will for weeks average \$50 per ton. but by far the greater quantity of ore mined will not reach to the half of this; were our mines running up to their capacity, it would be easy, by a simple picking, to obtain ores of of \$50 value. Galena occurs in a few mines in small quantities, and is generally rich in gold and silver; blende is a frequent accompaniment of galena; arsenic and antimony are rarely present in more than traces. Nickel in workable proportion has never been met with, though it is often present in minute quantities.

The south end of the central belt has been most explored, and the larger number of known mines are within a radius of 20 or 30 miles of Charlotte.

But doubtless the number of mines in the Northern portion and also in the Eastern, belt, would have been larger had equal care been given to their exploration.

#### THE CENTRAL BELT—ENUMERATION OF THE MOST IMPORTANT MINES.

The most prominent mine hitherto has been the Rudisill; it comprises two parallel veins—easily operated by the same shafts—which have an average combined width of 8 feet.—This mine, after standing some years, has recently been re-opened, and new levels driven from the bottom of the o'd pump shaft, at a depth of nearly 200 feet. The vein at this depth is of somewhat greater width than usual; it carries a considerable amount of sulphuret, apparently of good grade. A small percentage of copper is found in the ore. The records of the past

yield of the mine are defective, but it is credited, by persons familiar with its history, with a production of \$1,000,000.

The old Char'otte Mine, to the north of the above, has been worked to the same depth; the production was large.

The Carson Mine, to the southwest of the Rudisill, has a wide vein and superior ore. Near by are the Sam Taylor and the Icehour mines.

The extension of the Rudisill mine to the south is met with on the plantation of Mr S. M. Howell; it has given some fine specimens.

On B. F. Wilson's plantation, to the southeast, is an unusually promising vein, unworked as yet; it extends to R. E. McDonald's plantation.

The Clark Mine is about one mile west of the Rudisill. This mine has borne a good reputation.

The Davidson Mine, or group of mines, one and a half miles west of Charlotte furnished an abundance of ore down to the water line; when abandoned, the ore was said to have been of good grade, but too refractory to be profitably worked with the appliances of 20 years ago.

Similar statements may be made of the Trotter Mine, to the southwest of the Clark. This mine is cut by the Atlanta Railroad.

The Capps Mine, five miles west of Charlotte, is another of the great mines of this section, and has yielded even more liberally than the Rudisill. The greatest depth reached is 200 feet. There are two converging veins, one of which, at its north end, passes into another property, and is known as the McGinn Mine. Both veins are wide and strong, and have given

superior ore. It is not worked at present.

The McGinn Mine is one of the few mines of this section now in operation, and is at present in "bonanza." The north end of the vein has yielded a high grade of copper ore, while the south end is for the most part auriferous iron pyrites. The ore bodies at present are of unusual width and of good grade; the assays of it have been very flattering.

The Dunn Mine, nine miles west of Charlotte, has three veins, one carrying copper.

The Stephen Wilson Mine is nearly nine miles west of Charlotte; it is on a property of 340 acres; there are ten well defined veins. The only vein worked runs in an east and west direction (the veins of this country course N. E. and S. W. usually), and has yielded a large amount of good ore, some of it of exceptionally high grade.

This vein has been the most extensively worked of any in this section; it is entered by an inclined shaft on vein No. 2, and exploited by three levels, at 120, 200 and 300 feet, respectively on the incline.

The greatest length of the underground workings is 1,500 feet. The ores carry a small percentage of copper. These facts are due to the courtesy of Capt. S. Grose, formerly Superintendent.

The Frazier, Hipp and Todd, and some other mines are near by. The Todd is now actively at work, and as reported, with good results, there being a large amount of valuable ore on the dump.

The Kerns or Hopewell Mine, 11 miles northwest of Charlotte, bears

iron and copper pyrites containing gold; the copper is frequently present in such proportions as to make it a valuable smelting ore.

The Ferris Mine, five miles northeast of Charlotte, is another example of the copper bearing veins of this section. It has been worked to a depth of 90 feet; the ore is largely brown oxide, with iron pyrites and frequent masses of copper pyrites; the latter is admirably adapted to smelting; samples of its ores have assayed very high.

The Ferris, the Henderson, the McGinn, the Chapman and the Dunn are parallel, but at some distance apart; they are well reputed.

On the farm of H. A. Hunter, of Huntersville, sixteen miles northwest of Charlotte, is a gold vein with a very promising exposure. It has been explored only to the depth of 23 feet, and found to carry some very good ore.

The Hunter, the Crosby, the Rogers and the Pioneer Mills are from 12 to 17 miles nearly east of Charlotte; the last three carry copper pyrites in considerable quantity. The debris about the Pioneer Mills is everywhere copper bearing, and points to the probability that the ore was of good grade as to copper contents.

The Newell, the Pharr and eight other mines are near by.

The Johnson, the Stinson, the Maxwell, the Bane, the Ray and the Rea Mines are seven to nine miles nearly east of Charlotte. Most of them have been considerably worked.

The Tredenick Mine is seven miles southeast of Charlotte. The ore is auriferous iron and copper pyrites.

The Alexander Mine is five and a



half miles nearly east from Charlotte. It has been extensively worked.

The Caldwell Mine is about six miles nearly east of Charlotte. It has yielded large bodies of good ore.

The Harris Mine is ten miles from Charlotte in an easterly direction. The last mine has now been divided into several. Some unusually rich pockets have recently been discovered.

The Elliott Brothers have recently discovered fine veins on their property, five miles from Charlotte, carrying both brown ore and copper pyrites of fine quality, but sufficient work has not yet been done to ascertain the full value of the discovery. Should present anticipations be realized, the copper pyrites will have a ready and profitable market as a fluxing ore.

The Nolan, the Jordan, the Means, the Bennett, the Cathey, the G. C. Cathey, the Sloan, the Gibson, the McCorkle, and several others, are within reach of Charlotte.

Concord, the county seat of Cabarrus county, is the centre of a large group of mines, of which twenty at least are widely known, while there are many others which are known only locally. Among those with reputation are the following :

Phoenix Gold Mining Company, with a property of 200 acres, on which are several veins, most of which carry copper as well as gold. The debris lying about, points to ore of a good percentage. Most of the veins on the above property extend to the lands of the Vanderburg Mining Company; the ores are similar to those of the above mine.

The North Barrier, the South and

the Middle Barrier are in close proximity to the Phoenix, and adjoining is the California Company's property.

The Reed Mine, on Rocky River, about 25 miles northeast of Charlotte, is chiefly of historic importance. Gold was found here in 1799, and for a period of more than 50 years it continued to be prolific of large nuggets of native gold, weighing from one pound to 28 pounds. For a long period it was worked only as a surface or placer mine, though ultimately a vein was discovered, and worked to a depth of 90 feet, with satisfactory results.

About Salisbury are groups of mines, but none of them have attracted the attention they deserve.

A few only, like the Yadkin, have acquired any considerable reputation.

The range from Salisbury to Greensboro' has not been examined with the care received by the sections we have just discussed; still a large number of mines are known; only the more important can be enumerated: The McCulloch, Jack's Hill, and Lindsay, make up a vein about one mile long. The former gave both gold and copper ore of a high grade. The vein is from a few inches to ten feet wide.

The Fisher Hill mine, five miles south of Greensboro, is reputed to have good ores. The Hodges Hill Mine, in this vicinity, carries copper pyrites. Ten miles south of Greensboro' is the Gardner Hill Gold Mine with several veins yielding both gold and copper, the latter ore being of high grade.

#### THE "SLATE BELT"

The "Slate Belt" is best described in a general way as argillaceous, but

other varieties often occur. This belt, like the Granite belt previously discussed, abounds in mines of gold, which often carry silver, copper and lead, in considerable quantities, in addition.

Forty mines are known to the Mining Board in South Carolina, most of which lie in this formation; three only have been worked to any extent or have acquired any great notoriety.

The Dorn Mine in Abbeville is the best known. Perhaps no mine in the United States has given such rich ores, and in such quantity, as this once famous mine. It is not known that any record has been kept of its production.

The Brewer Mine, fifty-two miles southeast of Charlotte, is one of the most peculiar in the Gold Mining Region of the South. Most of the eminence on which the mine is situated is ore, but of so low grade that it can be worked successfully only by the treatment of immense quantities.

The Hale Mine, southwest of the Brewer, has been worked to the depth of 100 feet. The ore is relatively low grade, and as it contains a large per cent of sulphurets it has proved too refractory to work with the appliances now in use.

On the Slate Belt the more important mines in North Carolina are the following:

The Howie or Cureton, in Union county, and 22 miles southeast of Charlotte. This mine has, with two exceptions, been more extensively worked than any mine in North Carolina, the greatest depth reached having been 300 feet nearly. No record of the amount extracted is now known.

The Wyatt Mine is two miles east of the Howie, and the Washington a little to the north, and near by is the Smart Mine.

Fifteen miles nearly southeast of Charlotte occurs an interesting group—the Lemmonds, Folger Hill, Davis, Lewis and Phiffer,—the latter having yielded enormously rich pockets.

Fifteen miles east of Charlotte is the Stewart Mine, which has given rich ore; galena and blende are frequently found with the ore.

The Moore, Dulin, Fox Hill and Crump Mines are near by.

Long and Crowell Mines, in Cabarrus and Union counties, have more than 20 veins, some of which carry copper and lead as well as gold.

The J. C. Hamilton Mine, in Anson county, is extensively opened; the vein is wide and the ore of good grade; large bodies of ore are reported to be exposed.

Gold Hill Mine, in Rowan county, 15 miles from Salisbury, was discovered in 1842, and has been more extensively worked than any mine in the State; only two of its veins have proved of workable value—the Earnhardt and the Barnhardt, the former having been exploited to a depth of more than 700 feet, and ore of fair quality has been found to its very low point: a small per cent of copper is an almost invariable constituent. The large bodies of ore have allowed this mine more than 20 years of continuous and, for the most part, profitable work. During the war work was suspended, and since the surrender the operations have, from lack of capital, been too desultory to do justice to this fine property. The pro-



duction of Gold Hill has been at least \$2,000,000.

The MacMakin and the Trautman are near by.

Ten miles north of Gold Hill is Silver Hill, notable as being the only lead mine in North Carolina thus far deemed workable; the lowest workings are more than 600 feet in depth. The ore is argentiferous galena, with a large per cent of blende. There are other localities near Silver Hill which promise to yield ore of a similar character.

The Ward Mine is in Davidson county, 15 miles east of Lexington. It is both a surface and vein mine. It was favorably noticed by Prof. E. Emmons, the late State Geologist.

The Jones and the Lofin mines are to the east of the above.

The Welborn Mine, 6 miles from Lexington, is now being worked.

The counties of Montgomery and Stanley are known to abound in the precious metals, but being remote from the highways of commerce, little has been done in the way of exploration. The Steel and the Russel mines are the only ones of more than local importance; the latter yields an enormous body of low grade ore, and is now worked.

The gravel mines of Montgomery are attracting deserved attention; the Christian Mine is the best known example of them; only a small excavation has been made in the bank, but even this, with an inadequate supply of water, afforded large and gratifying results.

In Moore county only a few mines are in operation, the most important being the Cagle Mine and the Chick Mine; the latter also carries copper.

#### THE "GNEISSOID BELT"

On the third belt, alluded to at the commencement of this report, the most noted mine is the King's Mountain. It is situated 40 miles southwest of Charlotte, and one mile from the railroad from Charlotte to Atlanta and on the northerly part of the King's Mountain Ridge of Revolutionary fame. The mine is in limestone, and the ore is altogether unique. The ore body is made up of lenticular masses of impure carbonate of lime, (the immediate associate of the gold is a mooted question) In places it is composed of the ordinary brown ore of gold mines of this region; the body last exploited varies from six to thirty feet in thickness, which for the most part is workable material. The ore is unusually free from sulphurets; a former chemist of the mine says that it carries only three per cent, composed of galena, blende, tetrahedrite, iron and copper pyrites, telluret of lead, and perhaps telluret of gold. The ore is low grade, but the great width of the vein, the ease and cheapness with which it is mined, the facility with which it is crushed, and the relatively large proportion of gold which can be extracted, have made this mine a favorite; for years it has made a more steady return than any other mine in this section. The product of gold is probably about \$750,000. The greatest depth is about 250 feet.

The Crowder's Mountain Mine, four miles to the northeast, and on the east side of the mountain of that name, comprises very large ore bodies, but they have not been sufficiently explored to justify any assertion as to the value of the mine. Valuable

bodies of barytes are known to exist on this mountain.

On the High Shoals property (to the northwest of the King's Mountain Mine) are three mines: Long Creek, Asbury, and Dixon or High Shoals mines—from all of which the production in former years has been very large; the first of these is in the process of reopening, and the preparations for reworking are vigorously pushed. Good bodies of ore are known to exist. Other and smaller mines are near by.

This property is worthy of notice on other grounds, and will be alluded to hereafter.

Other mines near this formation, and for convenience classed with it are the Oliver Mine, the Rhodes, the Rhyne, Duffie and the Burrell Wells; the latter, now being opened, is about ten miles from Charlotte, and near the west bank of the Catawba River. There are at least four veins on this property, and not unlikely several cross veins; ore of the finest quality is being mined; it promises unusually well.

The Burton Mine in Lincoln county was explored to some extent during the last summer.

The Cansler and Shuford mines are in Catawba county.

The County Line Mine is in Davie county.

The Gap Creek Mine, in the southeast part of Ashe county, is worthy of notice in this connection. The vein has the most marked characteristics of a fissure vein; it has been cut at a depth of about 40 feet, and found to be from 18 inches to 36 inches in width. This deposit has yielded some beautiful peacock copper ore, of

high value, both in copper, gold and silver. It is one of a group of mines, but none of the others have been explored.

Vein mining in the mountains has been little followed, the veins rarely being of any size that would yield a profitable return. The Baker Mine, on John's River, near the mouth of Wilson's Creek, Caldwell county, is a notable exception; the Michaux Mine, not far distant, has also acquired some notoriety.

Gravel mines have, however, been largely worked. The most noted localities are in Brindletown, Brackettown, Whiteside and Jamestown, in McDowell and Rutherford counties; Sandy Plains and Pacolet River, Pickens county; Fairfield Valley, Jackson county; Valletown and Veance Creek, Cherokee county; the gold belt of Cherokee probably extends into Georgia. Many of these gravel mines have been worked forty or fifty years, and are still productive.

The Mining Board does not feel at liberty to dismiss this portion of its report without some allusion to the past, and some consideration of the future, of this industry.

Prior to the war the old fashioned Carolina gold mill was the chief machinery relied on for milling, and with attention to the details of its work did well; nothing equal to it has since been introduced. After the war the California stamp battery was generally substituted, but with an exception here and there, it has proved lamentably inefficient for amalgamation purposes, though admirable as a crusher. Hereafter the prosperity of our mines will largely depend on metallurgical establishments; wheth-



er these will employ mechanical, chemical or smelting methods, or a combination of them, is, as yet, matter of conjecture.

The three points of Charlotte, Salisbury and Greensboro are conveniently situated to accommodate their respective sections, and the railroad system of the State is now sufficiently extended to afford fair facilities for shipping, etc.

Most of the geological formations of this State extend into South Carolina, and whatever is said of the former may be said of similar parts of the latter State. In truth, the north and north west portions of the latter State are quite as closely connected, industrially, with North Carolina as with the more southern parts of their own.

#### TOTAL PRODUCTION OF GOLD AND SILVER, TO JUNE 30, 1877.

	Gold.	Silver.
North Carolina .....	10,370 492 18	\$14,743.33
South Carolina .....	1,382,455 71	2.93
Total.....	\$11,752,947 92	\$41,746.26

These figures are the official reports of the various Mints and Assay offices. But it is altogether probable that a large amount has found its way into the arts, without being properly credited; the actual production cannot have been less than \$15,000,000, and perhaps as high as \$20,000,000.

#### IRON MINES.

As regards iron, the resources of North Carolina are even greater, and are scattered quite as widely over the whole of the central and western part of the State. Some of the more important localities are enumerated below:

The central belt, though abounding

in places with the finest specimens of iron ore, has never been critically examined.

The formations to the east and to the west (in the latter case quite near to the boundary line separating the two formations) abounds in localities furnishing ore of the finest quality. The best known localities in the eastern belt are at Chapel Hill, Franklinville, Randolph county, Ashboro and along Deep River. The ore at Chapel Hill is a red hematite, and is found about one mile north of the University. It is both abundant and pure. Chemical analysis and the practical tests of smelting both show it to be a very good material for making a high grade of iron.

The Buckhorn Iron Mine, in the southeast corner of Chatham county, is a little to the east of the slate formation, being situated on the banks of the Cape Fear River; the deposit, which is mostly red hematite, containing in some parts a high percentage of manganese, is found capping a hill 200 feet high. The ores are fairly pure, and of a good grade for smelting purposes, as is indicated by its application to the manufacture of car wheels. This and other mines near by are worked by the American Iron and Steel Company, which has erected furnaces and spent a considerable sum in improving the navigation of the Cape Fear River.

More attention has been given to these mines than to any others in the State on account of their proximity to the Deep River Coal Fields near by, and the probability of a reliable and cheap fuel, such as no other mines in the State can boast of.

In the adjacent Triassic, on Deep

River, Chatham county, is an abundant supply of coal; it will be alluded to hereafter. The iron ores of the coal measures merit a passing notice; their extent and value are little known, inasmuch as forming part of the coal measures, there are few outcrops and hence little opportunity to study the series. When the coal deposits are worked we may expect a simultaneous exploitation of these ores, should their quantity and quality prove favorable.

The ball ore is largely carbonate of lime and carbonate of magnesia, and forms a good flux. The black band ore occurs in seams; the analyses thus far given do not indicate a large per cent of iron, and at the same time show a suspiciously large amount of phosphorus and sulphur.

The Evans Ore Bed, six miles north of the Gulf in Chatham county, is in the slate proper. The vein is reported to be six feet in thickness, the ore a red hematite of high grade and purity.

Ore Hill, in Chatham county, and near the Randolph county line, is a very promising locality. The veins are numerous and of good width. The records of analyses show a good percentage of iron, and mere traces of sulphur and phosphorus.

The later geological formations of Eastern North Carolina contain many deposits of iron ore, mostly limonite, but their number, extent and character are little known.

The beds of the gneissoid formation are, as respects extent and richness and certainty of supply, more important than those enumerated.

A few miles west of Greensboro, occur beds of ore unrivalled for width length and quality of ore. It has

received the name of the Tuscarora Range, and has been proved to extend at least 28 miles.

Three miles to the west is another series of beds, of a similar character, with a dip southeast. These ore beds vary in width from a few inches to several feet. The ore is magnetite and generally titaniferous. Subordinate parallel beds are frequent.

Hitherto the only mode of treating these ores has been by the Catalan Forge. Very little deep mining has been done on these beds.

The above memoranda respecting iron have been largely taken from the Geological Report of North Carolina for 1875.

Following the general line of the geological formations southwest, through Davidson, Rowan and Iredell counties, few localities of iron are known; but this stretch of country is too little explored to justify an assertion that there are none.

At Catawba River, near Sherrill's Ford, is found a noted locality, the ore from which is worked to some extent.

Another range of iron ore beds commences near this Ford and extends, with frequent interruptions, in a southerly direction fifty miles, to Cherokee Ford on Broad River, S. C.

In Lincoln county are found the Mountain Creek, the Furnace, the Morrison Brevard, Beard, Robinson, and the Big Ore banks.

These beds have been very inadequately explored, but so far as the practical tests of work apply they are known to be of good grade and great purity. Some of them were worked as early as the Revolutionary War,



and are now supplying ore for a few small furnaces.

To the northwest of these beds are two others which have been even less explored. viz: The Forney and the Barringer ore banks, in Catawba county.

The High Shoals property, in the central part of Gaston county, and on the South Fork of the Catawba River is by far the most interesting property in this section, both from its extent, its iron ore, its gold ores, for its agricultural capabilities, and above all, for its unsurpassed water-power. Rarely does a tract combine so many advantages.

The tract is narrow, but extends in a nearly nearly northeast and south west course fully ten miles. It is traversed by two railroads, and is quite near a third. The property comprises a smelting furnace and rolling mills, which have not been in use since the war closed. The supply of ore is from the Costner, the Ormond the Ferguson, the Ellison, and the Mountain Ore Bank; all these give a good grade of ore of great purity. The gold mines on the property, viz: Long Creek, Asbury, Dixon or High Shoals mines have been already alluded to: in addition, there is a vein of unusually fine compact iron pyrites, yielding 40 to 50 per cent of sulphur, which is remarkably free from arsenic and antimony, and is fully equal to the Norwegian and Spanish pyrites now so largely imported into England for the manufacture of sulphuric acid.

The magnificent water-power of the South Fork of the Catawba River at this point is capable of immensely greater application than it has ever

received; the discharge is 200,000 gallons per minute over a fall of twenty-three feet in all. Its great value will probably be in the driving of machinery for cotton factories, the uses to which it has been put employing probably not a fortieth part of its power.

The Crowder's Mountain iron property, owned by the Garrett Bros., Ringwood, Halifax county, is immediately to the south of the High Shoals, and extends to the South Carolina line. It is a tract of upwards of eleven thousand acres, and comprises the elevations known as Crowder's Mountain and King's Mountain. The Air Line Railroad, from Charlotte to Atlanta, nearly skirts the western boundary of the property. The Yellow Ridge Ore Bank, immediately under the west side of Crowder's Mountain has furnished a large amount of ore for the furnaces and forges of the vicinity.

Upon the flanks and summit of the mountain are found several beds — The ore is of unrivalled purity. The inaccessibility of the ground has prevented thorough exploration. On the east flanks of this ridge are several beds of fine barytes.

The King's Mountain Iron property is situated in South Carolina, a little south of the North Carolina line; the beds worked, of which there are several, extend in a northeast and southwest direction from a point about six miles northeast of Cherokee Ford to a point about two miles southwest. A furnace and forge was formerly operated at the Ford.

Six or eight miles southwest of Cherokee Ford is an iron property of several thousand acres, owned by the

South Carolina Manufacturing Company. The ore is abundant and of good quality, and furnace operations were carried on for a long time till in 1872, the low price of iron compelled the closing of the works.

The Bull Run beds, in Watauga county, N. C., and the beds adjacent give rich hematites, of the greatest purity.

The western portion of this State has by reason of its rugged character and the sparseness of the population never been explored as its promise justifies, but enough is known of its resources in iron to indicate that ore will be found in the greatest profusion.

In Surry county the localities known are; Tom's Creek, the Sand Bank, the Black Bank, the Hutchin's, the Upper Bank, and Shields. Hobson's is in Yadkin county.

The Rogers ore bank in Stokes county, is well known locally.

Davie, Forsythe, Caldwell, Wilkes, Alexander and Burke, and in truth most of the western counties abound in localities where surface specimens are found in large quantities, and in many places beds have been uncovered. The largest and most interesting deposit of iron ore is found in Mitchell county, the Cranberry mine. This deposit has an outcrop 1500 feet long, and several hundred feet wide; the ore is magnetite of the finest quality. Other localities in the same county are known.

Helton Creek, in Ashe county, is a well known locality.

Cherokee county abounds in limonite, which occurs widely distributed.

All through the State the fuel resources are usually wood and char-

coal, the pig iron manufactured being for the most part cold blast charcoal iron and of a fine quality, while wrought iron sent out from the forges enjoys the best reputation. The production is not large.

#### COPPER.

The copper industry of the State, though respectable, has been even less developed than the others described. Many of our gold mines have yielded copper ores in abundance, notably the Kerns, the Crosby, the Rogers, the Pioneer Mills, and the Gold Hill; the Yadkin, the McGinn, the S. Wilson, and the Rudisill, though not distinctively copper mines have at times turned out considerable amounts of smelting ore; to these may be added the Gardner Hill and the Fisher Hill in Guilford county, the Chick Mine in Moore county, and the Phoenix in Cabarrus county.

The Davidson or Emmons mine, in Davidson county, has been very productive. The Clegg Mine, in Chatham county, has also been extensively worked.

The most extensively worked copper mine in the State is at Ore Knob, Ashe county. The vein has been cut at points for 2000 feet, and varies in width from five to twenty feet; immense bodies of ore are found, and give constant work to a very complete establishment, capable of turning out two tons per day of refined copper.

At Elk Knob, Ashe county, is found a vein yielding copper pyrites, but as it has hardly been explored its value can only be conjectured.

The Peach Bottom or Maxwell Mine, in Alleghany county, was ex-



tensively worked prior to the war, and the concentrated material shipped to Baltimore for a market.

The southwestern counties of the State have numerous localities showing copper veins, but so little work has been done that the value of these localities can only be conjectured.—The Savannah, the Cullowhee, and the Warybut are regarded as the more promising.

#### COAL.

There are two coal areas in the State, both triassic, viz: The Dan River, in the valley of the Dan River, near the north boundary of the State, and the Deep River, previously described. The area of the latter is estimated by Emmons at 300 square miles. The former is probably less, but it has been very little explored. The coal beds of the latter have been cut at two points about three miles apart, viz: at Egypt and the Gulf, both in Chatham county. Prof. Emmons says that there are five seams, 'separated by black slates, black band iron ore and fire clay.' He also speaks of bituminous shales lying above the coal seams, to the thickness of 70 feet, which are capable of yielding 30 per cent of their weight in kerosene.

The Dan River fields have hardly been penetrated, though explorations were carried on to some extent dur-

ing the war, and some coal was mined.

Very flattering analyses of the coal from both basins have been given, and are set forth in detail in the various Geological Reports of the State, and also in the special report of Admiral Wilkes to the Secretary of the Navy in 1858. Nevertheless, their real value for domestic purposes and, what is more important, for metallurgical uses is largely a matter of conjecture.

The difficulty of securing a convenient and cheap fuel will in the future constitute the chief drawback to a large development of our mineral resources, but our abundant forests will for the present afford us all needed supplies at little expense.

Such are the more important mineral localities.

The members of this Board are fully aware that the list is imperfect, but the narrow limits of this paper forbade a longer one.

If this short catalogue of North Carolina mines shall be instrumental in preparing the way to a thorough examination of its resources, and shall also further aid in leading to a wise development of them, the Board will feel amply repaid for the effort expended in gathering these statistics.

For the Mining Board,  
GEORGE B. HANNA,  
*Chairman.*







